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10/565,102	01/19/2006	Toshiyuki Inagaki	10517/308	5415
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EXAMINER ALEJANDRO, RAYMOND				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/565,102

**Applicant(s)**

INAGAKI, TOSHIYUKI

**Examiner**

Raymond Alejandro

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 24-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-850)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date See Continuation Sheet

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :07/24/08, 03/18/08, 07/26/07, 01/19/06.

### **DETAILED ACTION**

#### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Information Disclosure Statement***

2. The information disclosure statements (IDS) submitted on 01/19/06, 07/26/07, 03/18/08 and 07/24/08 were considered by the examiner.

#### ***Drawings***

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 10 (*as described in paragraph 0003*). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 19 (*it is not*

*mentioned in the specific description of Figures 30-31*). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. Figures 30-31 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (*see paragraph 0003*). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

6. The preliminary amendment filed 01/19/06 does not introduce new matter into the disclosure.

7. The abstract of the disclosure is objected to because it does not appear to precisely describe the claimed invention. Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 24-46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
10. Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: it is immediately unclear to the examiner what is the specific structural or spatial relationship between the external member and the external restrainer member with respect to each other, and with respect to the entire fuel cell assembly or multi-cell modules. The claim as instantly drafted does not appear to sufficiently define a clear structural arrangement. Further clarification or correction is requisitioned.
11. Claim 27 recites the limitation "an internal surface" in line 4. There is insufficient antecedent basis for this limitation in the claim. It is immediately unclear whether the foregoing limitation is the same as "the internal surface" recited in claim 24, or if there is any relationship whatsoever between them.

12. Claim 38 recites the limitation "the cell monitor" in 3. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 24-30, 32-37 and 45-46 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Applicant's Admission of Prior Art (heretofore the AAPA) (*applicant's specification at paragraphs 0003-0017 and FIGURES 30-31*).

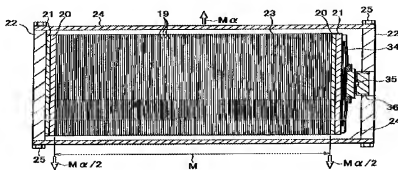
As to claims 24 and 34:

The AAPA teaches that in a conventional stacking technique, modules are retained by using a spring 34 which is disposed on an end of a cell stack in the cell stack direction, a swing portion 35 and an adjusting screw 36. The modules of stack 23 are retained with the spring force of the spring 34 providing a constant load in the cell stacking direction. Also, in some cases, the modules are restraining from outside the cell stack through the use of an external restrainer member (*applicant's specification at 0007*).

**FIGURE 31** of the AAPA clearly illustrates a fuel cell assembly including multiple modules or a plurality of stacked cells; either elements 21, or 20 in combination with the upper and lower element (right below and above reference number 25) do form a module frame surrounding or enclosing the cell assembly and extending in a cell stacking direction (See

FIGURE 31). Spring 34 can act as the external restrainer member located between any one of elements 21 or 20 and the swing portion 35 and/or an adjusting screw 36 which can serve as the external member. *Therefore, the fuel cell assembly arrangement of the AAPA reads on applicant's invention of claim 24 as instantly recited.*

**FIG 31**

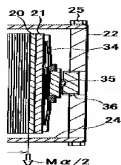


As to claims 25-26 and 28-29:

As shown in **FIGURE 31**, it is apparent that elements 20, 21 are capable of leaving the stacked cells unrestrained if necessary. Since the cells are stacked to one another, it can be said that they are adhered (in contact with) to each other.

As to claim 27:

Enlarged section of FIGURE 31 illustrates the presence of a space provided therebetween which can assist in relieving thermal expansion.





As to claim 28-29 and 32:

As illustrated in FIGURE 31, note that the stacked cells are disposed in series in the stacking direction; that there is disclosed a spring feature including a spring 34 which is disposed on an end of a cell stack in the cell stack direction, a swing portion 35 and an adjusting screw 36 (0007 & FIGURE 31). There are also the upper and lower elements (right below and above reference number 25) which represent the wall perpendicular to the cell stacking direction and they two have the ability of being displaceable if necessary. Note that the term displaceable only requires the ability of being displaced.

As to claim 30 and 33:

The AAPA mentions the presence of a coolant passage (0005). Since coolant is passing therethrough, it is expectable that certain amount of pressure be exerted in the surrounding areas.

As to claim 35:

Fuel cell assembly of **FIGURE 31** must include an element or member to electrically connect the fuel cell to an external device so as to be able to draw generated power out of the assembly. Thus, the presence of such an element or member is inherent.

As to claim 36:

Elements 20 and 21 can be taken to represent the two frame members are separated from each other (See FIGURE 31). On the other hand, element 22 is also separate and suitable for that purpose. Note that the present claims do not define any particular structural or spatial orientation.

As to claim 37:

The AAPA shows that gaskets 32 and adhesive seals 33 are provided in order to seal channels containing a groove (FIGURE 30 and 0005).

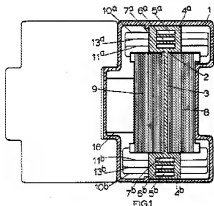
As to claim 45-46:

There is disclosed a spring feature including a spring 34 which is disposed on an end of a cell stack in the cell stack direction, a swing portion 35 and an adjusting screw 36 (0007 & FIGURE 31). Such a *spring* feature is made of a deformable material. Note that the swing portion 35 and/or an adjusting screw 36 serve as the external member which can be part of the casing and they are all integrated with the spring feature which applies tension. Further note that elements 22 can be used for that purpose as well.

Thus, the present claims are anticipated.

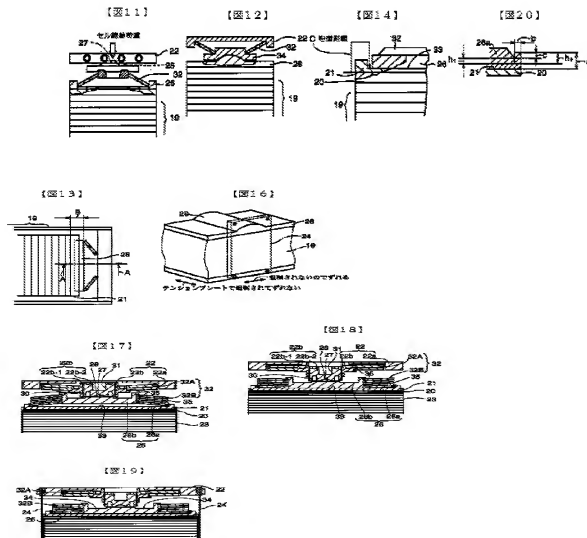
15. (at least) Claim 24 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by van Linden 4176213.

**FIGURES 1 and 3** of van Linden clearly depicts a fuel cell battery unit containing a number of fuel cell blocks (module) including an external member, an external restraining member; and a module frame wherein the external restrainer member is placed between the fuel cell module frame and the external member. The module frame includes a wall which surrounds the fuel cell blocks and extends in a cell stacking direction (**FIGURES 1 and 3**).



16. (at least) Claim 24 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Japanese publication JP 2002-124291.

**FIGURES 11-14 and 16-20** of JP'291 clearly depicts a fuel cell module unit containing a number of fuel cell blocks (module) including an external member, an external restraining member; and a module frame wherein the external restrainer member is placed between the fuel cell module frame and the external member. The module frame includes a wall which surrounds the fuel cell blocks and extends in a cell stacking direction (FIGURES 11-14 and 16-20).



17. (at least) Claim 24 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by German publication DE 196 45 111.

**FIGURES 1 and 2** of DE'111 clearly depicts a fuel cell module unit containing a number of fuel cell blocks (module) including an external member, an external restraining member; and a module frame wherein the external restrainer member is placed between the fuel cell module frame and the external member. The module frame includes a wall which surrounds the fuel cell blocks and extends in a cell stacking direction (FIGURES 1 & 2).

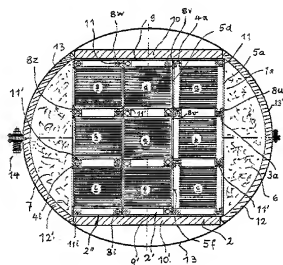


Fig. 1

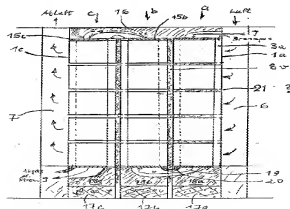


Fig. 2

***Claim Rejections - 35 USC § 103***

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission of Prior Art (heretofore the AAPA) (*applicant's specification at paragraphs 0003-0017 and FIGURES 30-31*) as applied to claim 24 above, and further in view of either US 5824199 or JP 09-092324.

The AAPA is applied, argued and incorporated herein for the reasons set forth above. However, the AAPA does not expressly disclose the specific cell monitor presser.

However, it is known in the art to use electrochemical cell having an inflatable member for providing uniform contact pressure and thus uniform electrical contact within the cell assembly. Such inflatable member comprises a pair of flexible plates (Applicant's specification at 0011 in reference to US 5824199).

Likewise, it is known in the art to have cell modules including frame clamping and an external enclosure to enhance contact pressure (Applicant's specification at paragraph 0012 in reference to JP 09-092324).

Thus, in this case, since the present claim do not specifically define the structure, spatial orientation or functional arrangement of the cell monitor presser, it is not unreasonable to state that the pressing members disclosed above are capable of maintaining uniform contact pressure, thereby being presser.

By combining these teachings, it would have been obvious to a skilled artisan at the time the invention was made to use the specific cell monitor presser of either US 5824199 or JP'324 in the fuel cell assembly of the AAPA as it is known in the art to use the disclosed pressing members for providing uniform contact pressure and thus uniform electrical contact within the cell assembly. Thus, mechanical stability and electrical conductivity are enhanced.

22. Claims 39 and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission of Prior Art (heretofore the AAPA) (*applicant's specification at paragraphs 0003-0017 and FIGURES 30-31*) as applied to claim 24 above, and further in view of German document DE 10048801.

The AAPA is applied, argued and incorporated herein for the reasons set forth above. However, the AAPA does not expressly disclose the specific non-electrically conductive material; and the specific elastic member.

As to claim 39:

The German document'801 discloses that it is known in the art to have fuel cell modules surrounded by an insulating layer (applicant's specification at 0009).

As to claim 41-43:

The German document'801 discloses that it is known in the art to have fuel cell modules surrounded by elastic material (applicant's specification at 0009). The specific friction coefficient is an inherent characteristic associated with the elastic material. *It is noted that the module cell is operatively connected to an end cell of the cell assembly, or at least, to certain degree, it is structurally connected to said end cell.*

By combining these teachings, it would have been obvious to a skilled artisan at the time the invention was made to use both the specific non-electrically conductive material and the specific elastic member of German document'801 in the fuel cell assembly of the AAPA as the German document'801 teaches that such materials find useful application for surrounding and/or enclosing fuel cell modules due to their chemical compatibility and that such materials are also provided to relieve mechanical movement of the modules due to thermal expansion.

23. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission of Prior Art (heretofore the AAPA) (*applicant's specification at paragraphs 0003-0017 and FIGURES 30-31*) as applied to claim 24 above, and further in view of JP 09-092324.

The AAPA is applied, argued and incorporated herein for the reasons set forth above. However, the AAPA does not expressly disclose the specific module frame made of a resin.

However, it is known in the art to have cell modules surrounded by a material comprising a resin which is provided between multi-cell modules and inner wall of a frame as well as between an outer wall of the frame and the enclosure (Applicant's specification at paragraph 0012).

By combining these teachings, it would have been obvious to a skilled artisan at the time the invention was made to use the specific module frame containing a resin in the fuel cell assembly of the AAPA as it is known in the art to use resin material as part of the module frames provided between multi-cell modules, or inner wall of a frame as well as between an outer wall of the frame and the enclosure. Thus, such a material finds suitable utility for enclosing or covering electrical devices.

24. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission of Prior Art (heretofore the AAPA) (*applicant's specification at paragraphs 0003-0017 and FIGURES 30-31*) in view of German document DE 10048801 as applied to claim 41 above, and further in view of Nishiumi et al 2002/0187382.



The AAPA and the German document'801 are applied, argued and incorporated herein for the reasons set forth above. However, none of the preceding references expressly discloses the specific wire embedded in the module frame.

Nishiumi et al shows a fuel cell module 120 (0027/FIGURE 1) and a power supply cable 166 (*acting as the wire*) extending from the fixing portion 152 of the service plug 150 through the casing 122 and outwardly of the casing 122 (0037/FIGURE 1). *That is to say, power supply cable is embedded in the module frame.* In addition to that, there is disclosed a flexible bus bar 142 (*acting as the wire*) within the fuel cell module (0032/FIGURE 1).

By combining these teachings, it would have been obvious to a skilled artisan at the time the invention was made to use the specific wire embedded in the module frame of Nishiumi et al in the fuel cell assembly of the AAPA and the German document'801 as Nishiumi et al teach that such an embedded arrangement allows to maintain a satisfactory electrical connection while assuring safety against leakage or short-circuiting. Hence, electrical interconnecting characteristics and safety of the fuel cell module assembly are improved.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Raymond Alejandro/  
Primary Examiner, Art Unit 1795